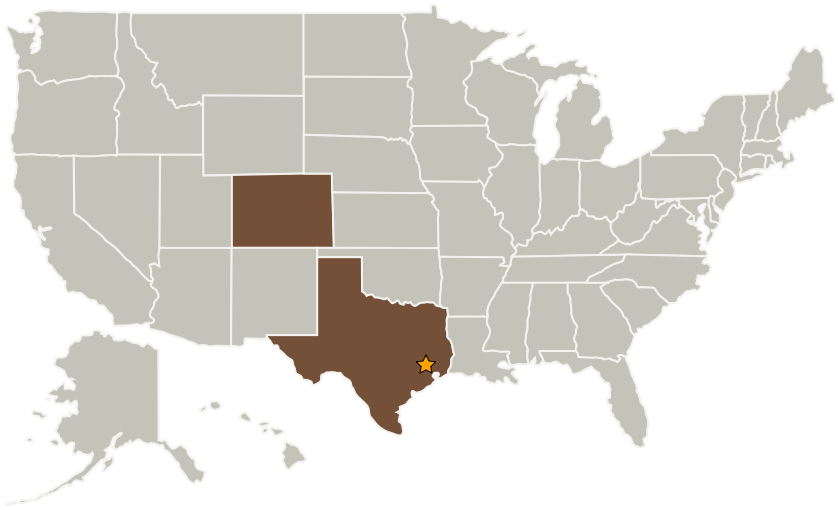
Real-Time Range Sensing Video Camera for Human/Robot Interfacing, Phase I

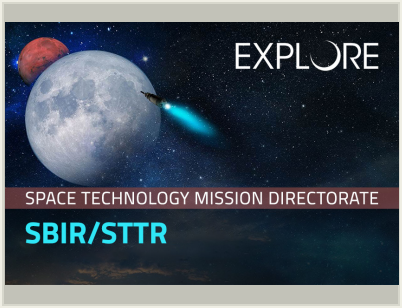
Completed Technology Project (2004 - 2005)

Project Introduction

In comparison to stereovision, it is well known that structured-light illumination has distinct advantages including the use of only one camera, being significantly less sensitive to background clutter, and not requiring the target object to have nonambiguous features. But because structured-light illumination requires a scanning process, it is inappropriate for humancomputer interfacing where the movements/gestures of a human subject are of interest. We propose the innovative process of composite pattern design as a means of constructing structured-light illumination patterns that measure surface topologies with only a single image and, thereby, are appropriate for recording real-time depth video. By moving the composite pattern into the Near-Infra-Red wavelength light spectrum and coupling with real-time optical processor, we intend to establish feasibility of a real-time, low latency, ambient light resistant, and high accuracy depth video sensor for producing a depth map of a scene applicable to virtual reality interfaces that permit control of robotic systems through human gestures by way of spatial tracking of user appendages in motion absent any wearable transmitters or markers.

Primary U.S. Work Locations and Key Partners





Real-Time Range Sensing Video Camera for Human/Robot Interfacing, Phase I

Table of Contents

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

Real-Time Range Sensing Video Camera for Human/Robot Interfacing, Phase I

Completed Technology Project (2004 - 2005)

Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Boulder Nonlinear Systems, Inc.	Supporting Organization	Industry	Lafayette, Colorado

Primary U.S. Work Locations	
Colorado	Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX04 Robotic Systems
  - TX04.5 Autonomous Rendezvous and Docking
    - TX04.5.1 Relative Navigation Sensors